

either fragmentation or packing of minority voting strength. And the more districts that are changed, the easier it may be to avoid county splits in the set of changed districts, and thus in the plan as a whole.

(b) The first three of the criteria listed in Section 2 above, 2.(a), 2.(b), and 2.(c), I treated as of highest priority since they are grounded in provisions of the U.S. Constitution, as these have been interpreted by the U.S. Supreme Court. However, because the indicia used by the majority in the *Golden Bethune-Hill* opinion to infer predominant racial motive included district boundaries that picked up pockets of minority population in a fashion that did not appear in any way compelled by the demography of the state, including ones that required unnecessary split of county/city lines (or VTDs) in a way that appeared linked to race, and because compactness and contiguity are referenced in the State Constitution, I was

especially attentive to issues of contiguity,²⁰ compactness²¹ and avoiding splitting of existing political subunit boundaries within the district in drawing my illustrative remedial configurations of the unconstitutional districts.²² I have also treated the

²⁰ Contiguity of legislative districts is required by the Virginia constitution (Article II, Section 6). For redistricting, the standard (mathematical) way to define contiguity is in terms of the ability of voters to move from any one part of the district to any other part of the district without leaving the district, i.e. the district should not consist of multiple geographically separated parts. Special issues of interpretation of this definition of contiguity arise when district boundaries include substantial bodies of water in whole or in part and district contiguity is established over an area of water, especially when the water in question is adjacent to more than one district. In such cases, sometimes contiguity is interpreted in pragmatic terms as connection from any land part of the district to any other land part of the district via land, bridge or tunnel. Alternatively, when the boundaries of political, voting, or census units encompass water areas along with land areas, contiguity by water might also be established when legal boundaries touch, even if the areas that are joined in this way have water at each edge of the boundary. In Virginia, contiguity has also been interpreted as occurring when there is a direct line of sight connection over a body of water between two pieces of land. But the interpretation of contiguity by water has sometimes been controversial, and even the general notion of contiguity can be interpreted in more than one way and is complicated by how the U.S. Bureau of the Census allocates portions of rivers and lakes to different census blocks, and how it deals with islands.

²¹ Compactness is a criterion that is identified in Article II, Section 6 of the Virginia Constitution: “Members of the House of Representatives of the United States and members of the Senate and of the House of Delegates of the General Assembly shall be elected from electoral districts established by the General Assembly. Every electoral district shall be composed of contiguous and compact territory and shall be so constituted as to give, as nearly as is practicable, representation in proportion to the population of the district.” There are multiple ways to define/operationalize the concept of compactness (see discussion below).

²² Avoiding the splitting of counties or cities is a traditional districting criterion that has been referenced in many U.S. Supreme Court cases dealing with districting, including *Mahan v. Howell* 410 U.S. 315 (1973). While that case dealt with population inequalities and there have been newer cases clarifying appropriate population equality for legislative districts, in that case the Court also acknowledged the position of the State of Virginia that counties had a special status re legislative redistricting in that: “Under Art. VII, §§ 2 and 3 of Virginia's Constitution, the General Assembly is given extensive power to enact special

eighth criterion, neutrality, as a necessity in a court-adopted plan.

I treated incumbency protection as the least important of the criteria I took into account. However, I was nonetheless able to create maps to remedy the constitutional violations that avoided the pairing of any 2017 incumbents in terms of their home addresses.

III. Operationalization of Districting Criteria for Purposes of Comparing Plans

legislation regarding the organization of, and the exercise of governmental powers by, counties, cities, towns, and other political subdivisions;" and the Court majority also asserted that "respecting the boundaries of political subdivisions" is a "rational state policy" (at 323-4). The Virginia legislature in 2011 also identified counties as one indicator of community of interest, but listed it as one among many. "Communities of Interest Districts shall be based on legislative consideration of the varied factors that can create or contribute to communities of interest. These factors may include, among others, economic factors, social factors, cultural factors, geographic features, governmental jurisdictions and service delivery areas, political beliefs, voting trends, and incumbency considerations. ...The discernment, weighing, and balancing of the varied factors that contribute to communities of interest is an intensely political process best carried out by elected representatives of the people. Local government jurisdiction and precinct lines may reflect communities of interest to be balanced, but they are entitled to no greater weight as a matter of state policy than other identifiable communities of interest." (<http://dls.virginia.gov/pubs/redist/2011Draw1.pdf>)

Since counties (and cities) represent identifiable communities of interest, my focus in the constitutional redrawing of the eleven districts was on the maintenance of county (or city) boundaries, since this was the only straightforward and indisputable indicator of communities of interest available to me.

1. I now discuss briefly, and in the abstract, how I measured compliance with each of the nine criteria with respects to potential remedial plans.

(a) population equality

Since the present map and all of the maps offered in briefs submitted on or before November 2 specified district configurations which were within one percentage point of ideal district size,²³ and this level of population equality had been previously achieved by the State of Virginia, the illustrative maps I have offered to the Court also provide this level of strict population equality. This population equality standard ensures population equality consistency across all of Virginia's House of Delegates' districts, and was mandated by the Court.²⁴

²³ These population values are based on the 2010 Census. In 2018, because of births, deaths, and migration in and out of the districts, the 2010 census figures can only be regarded as approximations to the present population in the legislative districts in Virginia. Nonetheless, the 2010 Census still provides what is unquestionably the best information now available about Virginia's population demography, and is the appropriate data to use. In fact, it is the only data we could use that can be projected down into units of census geography.

²⁴ In other jurisdictions with a different factual background, previous redistricting decisions of the U.S. Supreme Court indicate that state legislative plan with greater than a plus or minus one percentage point deviation from ideal may also be constitutional. Except for special circumstances involving a finding of boundary manipulations (see *Larios v. Cox* 300 F.Supp.2d 1320 (N.D. Ga. 2004), summarily affirmed by the Supreme Court) a plus or minus five percent total population deviation has generally been regarded as acceptable for state legislative maps, even though such a deviation would be completely unacceptable for congressional districting.

(b) equal protection, the realistic opportunity of a minority community to elect candidates of its choice, i.e., to create what is sometimes referred to as a “minority opportunity district” or a “minority opportunity to elect” district.

i. the demography and geography of equal protection

a. In seeking to reach a professional judgment as a political scientist specialist on redistricting concerning the realistic opportunity for the minority community to elect candidates of choice – an analysis required by Section 2 of the Voting Rights Act, as well as for the closely related questions of minority fragmentation or packing, a necessary starting point is a review of the demography and geography of the State of Virginia. This review should encompass both the unconstitutional districts and areas of the state proximate to them, including districts adjacent to those districts and districts containing counties that are found in whole or in part within the unconstitutional districts.

b. In conducting my review of the racial demography of the State in the areas near the unconstitutional districts, it became clear that there were substantial minority population concentrations in counties such as Richmond, Henrico, Petersburg, Hampton, Newport News, Norfolk, Portsmouth and Chesapeake. And it also became clear that, even within counties, there was substantial heterogeneity in racial

demography. For example, eastern Henrico has very substantial African-American population while western Henrico is generally heavily white in demographic composition. Similarly, in Richmond, the western portion of the county, especially the northwest corner, is heavily white, while other portions of the county have very substantial African-American populations. And similar differences in racial geographic concentration arise in the eastern portion of the state both across counties and within-counties.

c. In Golden Bethune-Hill we unconstitutional districts are ones where there is a previous history of minority electoral success, but where race has been made the preponderant factor in the redrawing of district lines. In many of the unconstitutional districts black population from adjacent districts have been added to districts in which there was already minority success under a previous plan, and/or white population removed. Under these circumstance, it is inevitable that a narrowly tailored remedy plan will, with near certainty, reduce the black voting age population percentages in many if not all of the districts found to be unconstitutional. And concomitantly such a reduction in the minority population in the unconstitutional districts will, as a mathematical necessity, lead to an increase in the minority population in some of the districts adjacent to those found to be unconstitutional. These changes should positively affect the effective representation of African-American voters in some districts adjacent to the unconstitutional districts. It is also possible that some of the illustrative

reconfigured districts adjacent to the unconstitutional districts will now be districts in which, even though not majority African-American in their voting age population, the African-American community has a realistic equal opportunity to elect a candidate of choice that was previously denied them. But, in my illustrative maps, any such consequences were entirely incidental effects of the need to redraw the unconstitutional districts in a constitutional fashion.

ii. In redrawn unconstitutional districts, in addition to demography, the second essential element in considering the potential to create a “minority opportunity to elect” district involves the study of elections in the relevant areas of the state.

a. In looking to specify the set of elections that it useful to analyze, there are several principles of “best practice:”²⁵

a1. The elections analyzed should be ones where a viable minority candidate is a contestant.²⁶ Usually we examine election results involving contests where there

²⁵ For further discussion of this and related issues see Grofman, Bernard, Lisa Handley and Richard Niemi. Minority Representation and the Quest for Voting Equality, (Cambridge Univ. Press, 1992). While the discussion of voting rights case law in this work is completely outdated, the technical discussion of statistical tools for use in the voting rights context remains relevant.

²⁶ Looking at contests where there is no minority candidate can be misleading if white voters are less likely to vote for a minority candidate of a given party than they are to vote for a non-minority candidate of that same party.

are both minority and non-minority candidates, and where there is a least one viable candidate of each race.²⁷ Information can, however, also be gleaned from contests where only minority candidates are involved, or where there is an election involving a minority candidate in which that candidate wins uncontested.

a2. The elections analyzed should be recent.

a3. The elections analyzed should be in the parts of the state where the proposed remedial district or districts are to be created or, if the election being analyzed is statewide, it needs to be possible to report results of that election for areas of the state that (in whole or part) comprise actual or hypothetical districts, i.e., what are commonly called “recompiled” elections. The nature of the districts sufficient to provide the minority community a realistic opportunity to elect candidates of choice can vary across different areas of a state. Looking at data on “recompiled” elections across different potential districts allows us to take into account local variations in voting behavior and demography.

a4. The elections analyzed should be of the same or very similar type as the type of elections at legal issue. Here the key distinction is between partisan and non-partisan elections: Partisan elections offer voters a partisan cue, and are more likely

²⁷ Election results where candidates of one race are not viable can be misleading if projected into contexts where we might expect there to be viable candidates of more than one race. However, essentially uncontested contests can still be useful sources of information.

to trigger partisan attitudes and loyalties on the part of voters to the candidate of whichever party they are most attached to. Another difference is that partisan elections are typically a two stage process in which there is a contest for party nomination and then a general election.

a5. If elections are of a partisan nature, then the realistic analysis of potential to elect minority candidates of choice must consider both the likely outcomes at the primary election phase and at the general election phase of the election process. To put it simply: in a partisan election contest, to win, you must first be nominated (in a party primary) and, once nominated by a party, be able to go on to win the general election.²⁸ Thus while for all elections, for voting rights purposes, analyses must be attentive to the (expected) racial composition of the districts; for partisan contests it is important to be attentive to the expected racial composition of the electorate at both phases of the election process, primary and general.

²⁸ A more formal way to express this insight is in terms of what statisticians refer to as the *Law of Conditional Probability*. That Law states that the probability of the joint outcome (A and B) equals the probability of the outcome A if the outcome B has occurred, multiplied by the probability of obtaining the outcome B. In the partisan election context, what this means is that the probability of a (minority) candidate of choice of the minority community being elected is the product of the probability that a (minority) candidate of choice of the minority community wins the general election if that candidate is the nominee of a given political party multiplied by the probability that a (minority) candidate of choice of the minority community wins the primary of that party, summed over all parties.

a6. Analyses should be attentive to whether or not there is an incumbent in the election contest, and to the race or ethnicity of that incumbent and, for partisan contests, they should be attentive to the party of the incumbent.

b. My review of the potential for (continued) minority electoral success in evaluating proposed remedial maps, and comparing the present plan to the illustrative districts I have drawn I draw on these principles of best practices in evaluating minority voting equality issues.

b1. I have looked at contests involving an African-American candidate;

b2. I have looked at recent elections, with the oldest from 2012 and some considerably more recent;

b3. I have looked at contests taking place in the area of the state where there is substantial black population in or proximate to the districts found to be unconstitutional;

b4. I have looked at general election contests that are partisan in character;

b5. I have looked at both primary election contests and general elections;

b6. I have been attentive in my analyses to whether or not there was an incumbent in the contest and to the party of that incumbent.

b7. I have been attentive to what we can learn from compiled elections about potential legislative elections within the same geography.

c. specific data reviewed with respect to equal protection issues

c1. I have reviewed data on general elections and Democratic primary elections in 2016 and 2018 in Congressional District 3 and Congressional District 4 as these districts were reconfigured to be used in the 2016 election. In both 2016 and 2018, the elections in Congressional District 3 and in Congressional District 4 resulted in the election success of an African-American candidate despite the fact that the black voting age population in each of these districts, after they had been reconfigured following the *Personhuballah* litigation, was well under 50%: 48% in current CD3 and 42.7% in current CD4. In 2016, Representative Scott was re-elected in CD3 with 66.7% of the vote, and Mr. McEachin was elected in CD4 with 57.7% of the vote. In 2018, Representative Scott was re-elected with 91.2% of the vote and Representative McEachin was re-elected with 62.6% of the vote. I would call particular attention to the fact that Mr. McEachin was not the incumbent at the time of his initial election in CD4.

In the Democratic primary election in 2016, in the newly reconfigured Virginia congressional district 3, the incumbent, Representative Scott, was uncontested in the Democratic primary. In the Democratic primary election in 2016, in the newly reconfigured Virginia congressional district 4, where there was no incumbent, the only candidates in that primary were African-American, with A. Donald McEachin the overwhelming winner in that primary. Both won in the 2016 general election. In 2018 both the Democratic primary in CD3 and that in CD4 went uncontested and both African-American incumbents went on to win the general election.

These election results provide what I view as compelling evidence that, in the regions of the state where the eleven districts found unconstitutional are located, it may not be necessary to have districts with black majorities in order to allow the African-American community a realistic equal opportunity to elect candidates of choice.

C2. I have reviewed legislative election data on general elections in the unconstitutional legislative districts in 2017 and 2015. In all of these elections, in 2017, the candidate of the Democratic party, a candidate of choice of the African-American community, is uncontested in the general election.

c. For studying the realistic opportunity of an African-American candidate of choice to win elections in different legislative district configurations and in both

primary and general elections, I have also made use of statewide election data at the voter tabulation unit (precinct) level to create a “recompiled” election within any given proposed legislative district in the State. In particular, I examined projections into illustrative districts of the Obama vote in the 2012 general election, and the Fairfax vote in the 2013 Democratic primary to select a Democratic Party candidate for Attorney General of the State of Virginia. These are both biracial contests.

c1. In the 2012 contest President Obama was an incumbent; while he was not an incumbent in 2008. However, the choice of the 2012 election rather than the 2008 one is still a conservative one for assessing the likelihood of success of a minority candidate in a reconfigured district in that, in general, in the relevant parts of Virginia Mr. Obama’s support was higher in the general election in 2008 than in 2012 – though the differences are not great.²⁹

c2. In the 2013 Attorney General Democratic primary the African-American candidate, Justin Fairfax, was not an incumbent, and his principal opponent was a white candidate with a strong background who went on to win the Democratic primary, statewide, and to subsequently be elected Attorney General of the State of

²⁹ In accord with best practices, since we are now at the remedy phase of this case, it is appropriate to make use of relevant election data for elections closer to the present even though that data was unavailable in 2011, since these more recent elections may be more indicative of contemporary voting patterns.

Virginia. Looking at the Fairfax vote share in a statewide contest recompiled within a (new) district boundary is a conservative estimate of potential minority support in a Democratic primary, since a minority candidate residing locally with some degree of name recognition within the much smaller confines of a legislative district could be expected to win more votes (likely, considerably more votes) in the Democratic primary in the district than what was obtained by Mr. Fairfax.³⁰

c3. Similarly, we expect that a minority incumbent, especially one who had been elected more than once, would win more votes in the Democratic primary in the district than did Mr. Fairfax, almost certainly considerably more votes. Focusing on the unconstitutional districts, we see that, in the Richmond area there are very long-time incumbents in districts 69, 70, and 74 and an incumbent elected in district 71 in a special election in February 2017. In district 63 the incumbent from Petersburg was first elected in 2015. In the Norfolk-Portsmouth area, the incumbent in district 77 was elected in a special election in 2016; in district 80 there is a very long-time incumbent; in district 89 the incumbent was first elected in 2017, and in district 90 you have an incumbent first elected in a special election in 2014. In the Hampton-Newport News area, in district 92 you have a very long-time incumbent; in district 95 you have an incumbent first elected in 2015.

³⁰ The only likely exception to this observation is the legislative district in which Mr. Fairfax has his own home.

iv. minority cohesion and cross-over voting

a. The likelihood that a minority candidate of choice will win an election depends in part and upon the degree of cohesion of minority voters in their voting support for the minority candidate of choice, and the willingness of non-minority voters to vote for the candidate of choice of the minority community (what is often called “cross-over voting”). The level of minority cohesion on the one hand, and cross over voting by non-minority voters, on the other, is captured by the measurement of the level of what is called in the redistricting literature *racially polarized voting* (a.k.a. *racial bloc voting* (RBV)), a measure of the degree to which voting patterns can be predicted largely on the basis of the race of the voter. As noted in my Special Master Report in Personhuballah: “*Ceteris paribus*, high levels of minority political cohesion and substantial levels of white cross-over voting make it much more likely that a minority candidate of choice has a realistic opportunity to be elected, even in contests in Virginia where voting is polarized along racial lines, as long as minority population is large enough to allow for a party nomination and subsequent election with cross-over support from non-minority supporters of that party.”

b. I have reviewed the Report of Dr. Bradley Palmer, the only expert witness testimony in this case that I am aware of that provides statistical evidence about the level of racially polarized voting in the various districts in the 2011 legislative plan that were found to have been unconstitutionally drawn. I am reviewing that

portion of the expert witness testimony from Dr. Palmer solely for the limited purpose of assessing, from a social science perspective, proposed reconfigurations in terms of evidence offered about levels of racial bloc voting in different parts of the state.³¹ While Dr. Palmer's analyses deal with racial bloc voting patterns in the 2011 unconstitutional districts,³² his conclusion that a 55% black voting population, or even a 50% black voting age population, are not required in some areas of the state in order to draw districts in which minorities have a realistic equal opportunity to elect candidates of choice is the same as what I have reached through my own independent analyses.

c3. I have also reread and reviewed a portion of the Report of Dr. Lisa Handley in *Personhuballah*, attached as an appendix to a Brief submitted by the Governor of Virginia in that case in 2015. Dr. Handley analyses recompiled elections in the areas in what was Congressional District 3 in the 2011 Virginia congressional map. These areas correspond to geography now largely included in either Congressional District 3 or Congressional District 4 in the 2016 congressional map for the state

³¹ While I have read other expert witness reports in this case, and the discussion of these reports and trial testimony in the *Golden Bethune-Hill* opinions, I will not discuss the debate about the credibility/relevance of expert witness testimony offered by experts for plaintiffs or defendants about the issue of whether race had been the preponderant motive in 2011 line drawing in particular districts, since this debate is irrelevant to the remedial line drawing task set me as Special Master. The legal issues relevant to those concerns have already been decided by this Court in the 2018 majority opinion written after Supreme Court remand of the case.

³² Palmer's Report also presents racial bloc voting analyses of district 75, a district that was subsequently held not to have been drawn in an unconstitutional fashion.

ordered by a federal court, and thus to much of the geography in which the eleven unconstitutional legislative districts are located in whole or in part. Dr. Handley's analyses provide further confirmation of the claim that a 55% black voting population, or even a 50% black voting age population, are not required in some areas of the state in order to draw districts in which minorities have a realistic equal opportunity to elect candidates of choice.³³

c4. It is my professional judgment that Professor Bradley's analyses and those of Dr. Lisa Handley make use of standard and well accepted social science tools for assessing levels of racial bloc voting, and that each has used those tools in a competent and professional manner. However, I make use of this work only to provide supporting evidence to complement the analyses I have done on my own.

³³ As I stated in the Report of the Special Master in Personhuballah, "Dr. Handley's analyses of particular biracial elections demonstrate that, in the boundaries of CD3 as it existed in 2011, black voters were almost perfectly cohesive in their voting behavior (giving an average of over 97% of their votes to a particular candidate (the Democrat) in partisan statewide and congressional contests. However, even when whites and blacks support different candidates, a substantial proportion of white voters vote for the minority candidate of choice. For example, Dr. Handley finds that, in the geography specified by the 2011 version of CD3, a (bare) majority of white voters supported Barack Obama in the 2012 presidential general election, while white support for him in the 2008 general election within the 2011 boundaries of CD3 was also high, somewhere between 43% and 46% (see Table 5 in her Report). Even in the 2008 Democratic primary election she estimates projected white support for Obama in the 2011 geography of CD3 was 60.1%. In the 2013 primary election for the Democratic Party nomination for the Office of Attorney General, where white cross-over voting was lower, she still estimates that at least 32% of the white voters in that primary located in the boundaries specified by the 2011 version of CD3 cast a vote for Justin Fairfax, the African-American candidate (Handley Report, p. 13)."

Dr. Handley's conclusions are based on projections into hypothetical congressional districts, and Dr. Palmer's conclusions are based on projections into unconstitutional districts in the enacted map -- in both cases districts which are different from those in the give submitted remedial plans or in my illustrative legislative remedy plans. Accordingly, I have examined recompilations of the Obama and Fairfax votes directly into the actual proposed remedial districts. Such remedial district-specific projections provide a better intensely local appraisal of "minority opportunity to elect," namely one that implicitly takes into variations across different parts of the state in minority voting percentages, in minority level of cohesion, and in the level of white cross-over voting.

v. opportunity to elect

a. The combination of my examination of racial demography and of recompiled elections involving bi-racial contests, in conjunction with my examination of actual past election outcomes in the unconstitutional districts allows me to assess the potential for the minority community's "equal opportunity to elect" in redrawn versions of each of the unconstitutional districts, and to examine the potential the potential for retrogression in the opportunity of the minority community to elect candidates of choice in the unconstitutional districts in the configurations of these districts offered in the illustrative remedial plans I have drawn. Moreover, along

with the geographically rooted analyses I have done, they allow me to address the question of narrow tailoring with respect to minority equal opportunity to elect.

b1. A claimed justification offered by some individual Virginia legislators for the way in which the districts found to be unconstitutional were configured, was that only a district with a 55% black voting age majority could provide African-American voters with a realistic opportunity to elect candidates of choice. That assertion was rejected in the *Golden Bethune-Hill* majority opinion. As the opinion notes, the 55 percent value is unsupported by empirical evidence presented at the time of its adoption, and it fails to acknowledge key differences in racial bloc voting patterns in different parts of the state. Moreover, in my review of the Briefs submitted in the remedy phase of case, I find no empirical evidence presented that would support the conclusion that a 55% black voting age population is needed to assure the African-American community a realistic opportunity to elect candidates of choice in any (much less all) of the eleven districts found to be unconstitutional.

b2. As noted above, my own analyses specific to the unconstitutional legislative districts demonstrate that the claim that a 55% minority voting age population is always needed in a district to assure African-American voters a realistic opportunity to elect candidates of choice is, factually, flatly wrong. Indeed, to the contrary, a lower African-American voting age percentages will permit narrowly

tailored remedies in all of the legislative districts found to be unconstitutional.³⁴ I have reached this empirical conclusion by my own independent conceptual analyses of the basic elements of elections, such as the two-stage nature of partisan contests, and by my own independent empirical analyses of demographic and electoral data from Virginia, especially that in recompiled bi-racial elections in specific illustrative remedial districts.

c. avoidance of mechanical tests

c1. As the Supreme Court has made clear in recent cases, when judging whether a redrawn district continues to offer an equal opportunity to elect minority candidates of choice, maintenance of existing levels of black population or voting age population is not required as long as there can be a strong demonstration of a continued equal opportunity to elect.³⁵ There is no single “magic” number vis-à-vis black population or voting age population that will be needed to provide for the African-

³⁴ Even in district 75, where the Court failed to find unconstitutionality in that district as it was configured in 2011, my exploration of redistricting alternatives has demonstrated to my own satisfaction that, in a slightly reconfigured district 75, black voting age population percentages lower than 55 percent would still be sufficient to maintain that district as a realistic “opportunity to elect” district.

³⁵ In *Alabama Legislative Black Caucus*, the Supreme Court specifically rejected reliance on “a mechanically numerical view as to what counts as forbidden retrogression” *Id.* at 1273–74. It asserted that retrogression “does not require a covered jurisdiction to maintain a particular numerical minority percentage,” but instead “requires the jurisdiction to maintain a minority’s ability to elect a preferred candidate of choice.” 135 S. Ct. at 1272 (2015).

American community a realistic opportunity to elect candidates of choice. Rather what is required is an intensely local appraisal.

c2. I would emphasize that, in my line drawing, I have not ever sought to achieve any particular predetermined percentage of black voting age population within a district, but rather have drawn districts in accord with traditional districting principles and then afterward checked to make sure that unintentional vote dilution was not present. Essentially, what I found in my exploration of alternative mappings, including those submitted as remedial plans to the Court, is that there were always ways, sometimes rather obvious ones, to redraw unconstitutional districts so as to better preserve counties and improve compactness without minimizing or canceling out the voting strength of any protected group, which involved lower (sometimes substantially lower) African-American voting age populations than what are found in the unconstitutional districts in the 2011 Enacted map.

c3. The African-American share of voting age population varies across unconstitutional districts in the redrawn illustrative versions of the eleven unconstitutional districts I am presenting to the court. One reason for that variation is differences in the degree of geographic concentration of the African-American voting age population in different counties and different geographic areas of the state. I did not find it necessary to seek to determine the absolute minimum

percentage of African-American voting age population needed to create an “opportunity to elect district” for minority voters in particular areas of the state, since my illustrative versions of the unconstitutional districts are already narrowly tailored to remedy the constitutional violation found in them. To reiterate, the process of line drawing I engaged in was to draw remedial districts using traditional districting criteria, and only then to check (based primarily but not entirely on recompiled elections with minority candidates) that the district was one whose new minority population percentage did not, in my view, involve a denial of equal protection.³⁶

d. role of primaries

d1. As noted earlier, analysis of the “opportunity to elect” must take into account both the primary election and the general election, since both must be won. As I stated in my Special Master Report in *Personhuballah, ceteris paribus*, “voters who vote for Democratic (Republican) candidates in general elections are more likely to vote in the Democratic (Republican) primary than those who do not support Democratic (Republican) party candidates in general elections, if they do vote in a party primary. Because African-American voters are more likely to vote Democrat than Republicans in general elections, while white voters are considerably more

³⁶ Differences in the degree of geographic concentration of the African-American voting age population in different counties and different geographic areas of the state affected the extent to which the black voting age population in the reconfigured unconstitutional districts in my illustrative modules differed from that in the corresponding unconstitutional district in the 2011 Enacted map.

likely to be Republican voters in general elections than is the case for African-American voters, *ceteris paribus*, the expected proportion of African-American voters is going to be higher among voters in Democratic primaries than the proportion of African-American voters among all voters in a general election. Conversely, the expected proportion of white voters is going to be lower among voters in Democratic primaries than the proportion of white voters among all voters.”³⁷

d2. Given the demography and geography of the State of Virginia, it is my professional judgment that the most appropriate way to remedy the constitutional violation identified in the 2011 plan is to replace the present unconstitutional districts with contiguous equipopulous districts with fewer city or county splits than

³⁷ This general theoretical conclusion is reinforced by the relevant expert witness testimony of Dr. Lisa Handley offered in *Personhuballah* about compiled elections in the Richmond, Newport-News and Norfolk areas of the state. As noted in my Special Master Report in *Personhuballah*, she finds clear support for the expectation that black voters would be overrepresented among the voters in Democratic primaries in Virginia relative to the overall African-American share of the potential electorate (those of voting age). For example, she finds that, in the Democratic primary for U.S. President in 2008, blacks “opted to vote in the Democratic primary at a much higher percentage than whites did: approximately 18% of the black voting age population compared to approximately 11% of white voting age population cast a vote in the Democratic Primary in 2008” (Handley Report p.11). As she correctly notes: “The implication of this analysis is that “the percent black voting age population needed to produce an effective black district tends to be lower for Democratic primary elections than for general elections” (Handley Report p.11). *Ceteris paribus*, this finding clearly indicates that there can be a realistic opportunity for a minority candidate of choice to win the Democratic Party nomination even in a district that, overall, is less than majority black (majority minority) in voting age population.

are found in the 2011 plan and with at least as high average level of compactness. As discussed above, such remedial districts can be drawn with a substantial minority population that is sufficient to provide minority voters an equal opportunity to elect candidates of choice. Doing so does not require that the district have a black voting age majority. Rather it requires that voting be such that, when the African-American community votes in a cohesive fashion, a candidate of choice of the minority community can be expected to have a realistic opportunity to win both a primary and a general election -- with success in the general election occurring because the minority candidate of choice wins the support of white voters who share that candidate's partisan preferences (i.e., the minority candidate of choice receives some white "cross-over" voting support). The illustrative remedial districts I have drawn satisfy these conditions.

(c) not making race the preponderant factor

As I have emphasized throughout this Report, the process of line drawing I engaged in was to draw remedial districts using traditional districting criteria, and only then to check (based on recompiled elections with minority candidates) that the district was one whose minority population did not raise issues of equal protection. In reviewing other plans for compliance with this criteria I looked to at factors such as how many counties were split and in how many pieces, and did the choice of black voting age population in the district suggest narrow tailoring. In my own illustrative map drawing I prioritized redrawing the unconstitutional districts so as to reconfigure as many of them as possible in a constitutional fashion that

allowed them to lie wholly within a single county, and to have more than one redrawn unconstitutional district wholly within the same county when the county population and racial demography permitted (e.g. Richmond, Norfolk).

(d) contiguity

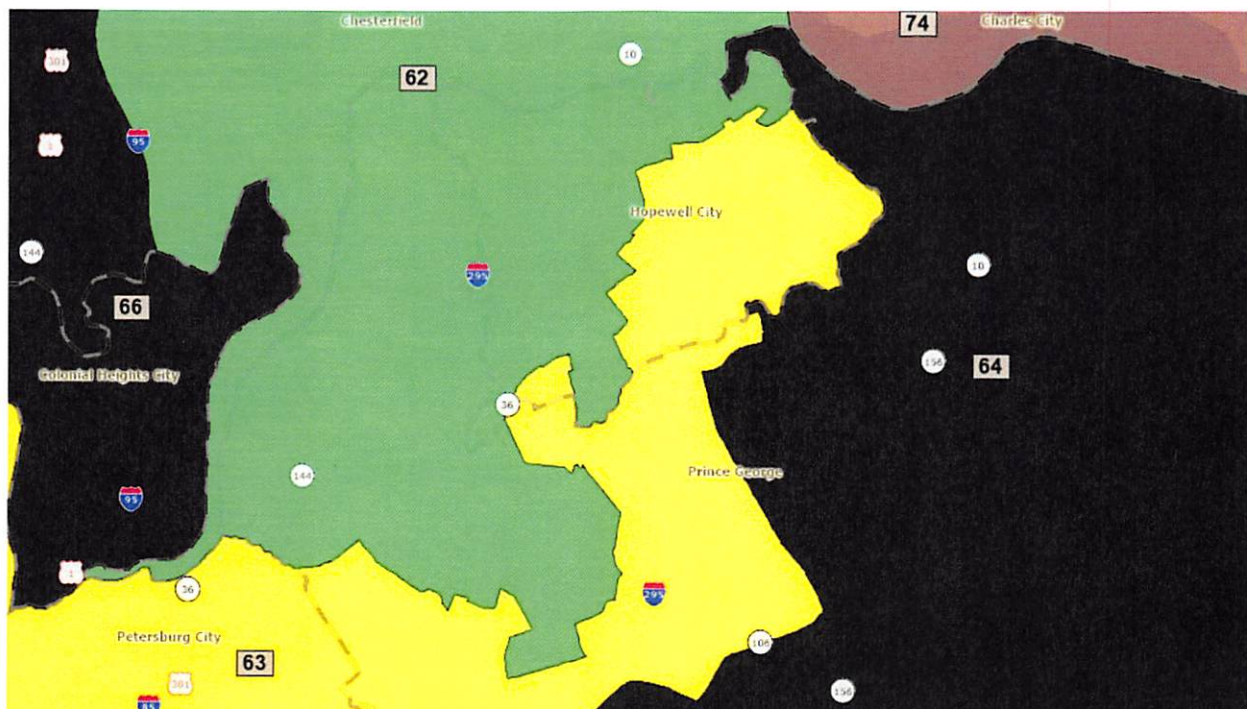
(d1) In general, I sought to maintain contiguity by land rather than by water. In particular, in the Norfolk and Hampton portion of the state, when I redrew districts I redrew the unconstitutional districts either wholly North or wholly South of the James River/ Hampton River.³⁸ With respect to other water bodies, I have sought to assure contiguity in terms of census defined units of geography. The census often assigns portions of rivers and other water bodies to separate census blocks.

(d2) Discontiguity is normally only considered a legal issue if it applies to a district being itself divided into discontinuous pieces. However, as a specialist on redistricting it is my view that redistricting plans in which two or more discontinuous pieces of some political jurisdiction are found within a single district are either evidence of poor redistricting practices or indicators of gerrymandering. While there is no present name in the redistricting literature for districts that include discontinuous pieces of the same city or county, I have coined the term “fracking” to refer to the creation of such districts, since fracking creates fissures in

³⁸ With the exception of district 100, which I did not change from the 2011 Enacted map, the redrawn districts in the Peninsula are drawn north of the river, and those in the Norfolk area south of the river.

the earth. This term has the advantage of creating a parallel usage to three standard terms of the redistricting literature that identify tools for gerrymandering: “packing,” “cracking,” and “stacking.” The 2011 map includes a number of districts with this type of discontinuity, and this *fracking* feature is found in at least 4 of the 11 unconstitutional districts (district 63, in Hopewell City; district 70, in Richmond; district 90 in Virginia Beach; and district 95, in Newport News).³⁹

³⁹ We can illustrate fracking discontinuity with a Hopewell example from the 2011 Enacted map. There are two discontiguous pieces of Hopewell City placed by the 2011 Enacted map in district 63. They have an average black voting age population (BVAP) of 65%, with one piece having a BVAP of 71.58% and the other having a BVAP of 65.45%. In contrast, the piece of Hopewell City (the remainder of the city) that is located in district 62 has a black VAP of only 20.27%. The map below illustrates this fracking, with yellow indicating District 63, District 62 in green, and 64 in black; with broken lines showing city and county boundaries.



Within these unconstitutional districts in the 2011 enacted map, the discontinuous pieces are, ones of higher black population, often considerably higher black population, than the nearby piece or pieces of the fracked county contained in districts that are not unconstitutional.

(d3) Except for the rare case where a city or county itself is legally defined as consisting of discontinuous pieces, a well-drawn redistricting map completely avoids such discontinuous mappings, as have I in all the maps I have drawn. In reviewing other proposed remedial plans I checked for evidence of *fracking*, and regarded it as a disqualifying feature of a plan.⁴⁰

(e1) county splits

In the illustrative maps I have drawn that I believe deserve consideration by the Court, I have been able to reduce city and county splits in the unconstitutional districts to a considerable extent. The details are provided later in the Report.

Since counties (and cities) represent identifiable communities of interest, my focus in the constitutional redrawing of the eleven districts was on the maintenance of

⁴⁰ Unfortunately, fracking discontinuities are not identified in the standard reports of city and country splits prepared by the State of Virginia, or in similar standard reports prepared by mapping packages such as *Maptitude*, and so must be identified visually or by creating a customized report.

county/city boundaries, since this was the only straightforward and indisputable indicator of communities of interest available to me.

(e2) VTD splits

Rather than focus exclusively on the VTD splits identified by the Court in its majority opinion, I have simply sought to minimize VTD splits in general, and have been successful in doing so, especially with respect to VTD splits involving the unconstitutional districts.

(f) compactness

The two main types of compactness, areal compactness (Reock) and perimeter irregularity (e.g., Polsby-Popper), measure two rather different things, and they do not necessarily move in parallel when district lines are changed.⁴¹ In each of the four geographic areas of the state, at least one of my illustrative modules is more compact on average on both the Reock and the Polsby-Popper measures than the corresponding districts in the 2011 Enacted map. Indeed, with only two exceptions, all the illustrative remedial modules I propose are as or more compact on average than their counterparts in the 2011 Enacted map on both the Reock and the Polsby-

⁴¹ See Richard Niemi, Bernard Grofman, Carl Carlucci & Thomas Hofeller, Measuring Compactness and the Role of a Compactness Standard in a Test for Partisan and Racial Gerrymandering, 52 J. Pol. 1155 (1990).

Popper measures.⁴² The two exceptions are higher on one of these two measures but lower on the other.⁴³ One such module has the narrow tailoring feature of limiting the changes in the Petersburg area to only three districts, and a variant of that map that changes four district does increase compactness as compared to the 2011 enacted map. The other module that is preferred to the enacted map on only one of the two measures of compactness retains the positive feature of keeping two districts wholly in Newport News, but draws a constitutional rather than an unconstitutional map for the Newport News district found unconstitutional.

(g) narrow tailoring

i. There were eleven districts in the 2011 Enacted plan identified as unconstitutional: 63, 69, 70, 71, 74, 77, 80, 89, 90, 92, and 95. These districts must

⁴² Compactness numbers are very difficult to interpret without some context, and it is virtually impossible to compare compactness values across jurisdictions in different states, or sometimes even within a single state across different parts of the state. The feasibility of drawing compact districts at any particular level of government varies with the geography (e.g., the density of populations, and the degree to which the political or other subunits which are being aggregated are themselves compact, and the existence of natural boundaries such as state lines or large bodies of water), compactness is best understood by comparing plans both for the same geography and for the same types of districts.

⁴³ In general, because the 2011 enacted map has a low level of compactness in many of its districts, the fewer districts whose populations are redrawn to be in more accord with traditional districting principles, the more difficult it is to draw a compact map. The illustrative maps I provide to the Court redraw many fewer districts than any of the five submitted remedial maps, thus making it harder for the maps I provide to achieve high compactness numbers relative to maps that change more districts.

be redrawn in a constitutional fashion in any remedy. Moreover, any court adopted plan must be narrowly tailored to remedy the constitutional infirmities in the 2011 enacted plan.

As noted earlier, one important element of a narrowly tailored remedy is that it should confine its changes to those districts which must be changed in the process of the obligatory redrawing of the 11 unconstitutional districts. This principle of narrow tailoring suggests the appropriateness of limiting the changes in any remedial plan to the 11 unconstitutional districts and to the 22 additional districts that are adjacent to the unconstitutional ones, a total of 33 districts -- unless there are compelling geographic or demographic reasons to the contrary.

The principle of narrow tailoring also suggests limiting district changes in the remedial plan to the 23 districts that contain pieces of counties that are also contained within the unconstitutional districts, except as might be needed to assure population balance across the redrawn districts. Unconstitutionality was specifically found for only eleven districts in the 2011 enacted plan --with this finding in all but one of the districts that were drawn with the avowed aim of containing a 55% black voting percentage. However, as a matter of simple geographic logic, if there are districts other than the unconstitutional eleven that contain portions of the populations of some of the 15 counties that have pieces in the eleven districts, at least some of those districts had to have been affected by/implicated in the line drawing that created the unconstitutionality in the eleven districts found to be unconstitutional. This is especially true if the portion(s) of a